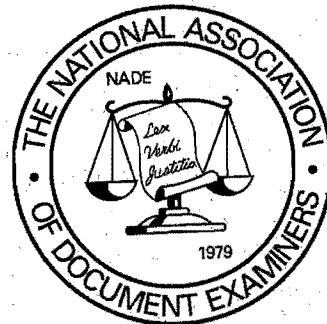


Journal of The National Association of Document Examiners, Inc.

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JOURNAL OF THE NATIONAL ASSOCIATION OF DOCUMENT EXAMINERS, INC.

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JOURNAL OF THE NATIONAL ASSOCIATION OF DOCUMENT EXAMINERS, INC.

Editorial

Electronic gadgets are everywhere. I am writing this editorial on my latest - a tiny handheld computer that weighs 18 ounces and far outperforms the room-sized computer that was the basis of my first computer experience 35 years ago. I look forward to the day that all relevant information about our field can be downloaded (for free), and I can have it in my hand for instant retrieval. Meanwhile, there is nothing like a good book, and for many of us there never will be.

When was the last time you read or re-read something that made you think or re-think about document examination? It is easy to skate along, doing case work, telling yourself you already know everything you need to know, but there is another path. You have at your disposal a most valuable resource – the NADE Library. The library contains over 50 books on document examination, forensic science, and expert witness/legal system issues. It contains copies of the NADE Journal from Day One and whole issues or articles from other important journals.

You may think you do not have time to read, or that obtaining books from the NADE library is too cumbersome a process. Not so. Borrowing books is a simple matter, and you can keep them for 45 or more days, which is long enough to read just a few pages each day. I find that a lot of document examination books need to be read slowly because they offer a lot to process, and the processing takes time.

The point is not necessarily to consume large numbers of books at a rapid rate, but to continue learning and growing and questioning as a professional. If you borrow a book that has meaning for you, then you may decide to find

a copy for your library. But if only a bit here and there strikes a chord, then you can make notes for your files and be glad that you had a chance to read the book without the expense of purchasing it. As with most specific interest books, document examination/forensic science books come at a high cost. The library committee spends its budget wisely, but it can afford some titles that the individual is loathe to purchase. This is, after all, one of the reasons we belong to a professional organization - to take advantage of resources that a group can offer to its individual members.

So if you have never, or not recently, borrowed a book from the NADE library, contact our librarian, Joan Winkelman,¹ and take the plunge. Chances are good that if you learn some new things, some new cases will come along to make use of that knowledge.

While you are waiting for a book from the library to arrive, this Journal issue will inform you with ideas on the writing of children, the classification of handwriting identification as a science, a source of information about tremor and handwriting, some thoughts on exemplars, and an interesting use of a digital camera. You will also learn, sadly, of the passing of one of our earliest members, Paul Stauffer, to whom this issue is dedicated.

**Emily J. Will,CDE
Chief Editor**

Errata: In the last issue I erred in listing Erich Speckin as having a B.S. degree. He wrote to correct me. His degree is a B.A. in Chemistry. Thank you Mr. Speckin, for the correction, and my apologies to all.

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WRITING OF FIRST AND SECOND GRADERS: AN OBSERVATION

by

Susan Abbey

Abstract

Document Examiners learn to distinguish between class and individual characteristics in graphically mature writers, but in the case of the writing of young children, the distinction can be blurred. The author recounts a personal experience with children's writing that illustrates this concept. Some basic writing systems are discussed and fonts based upon them are printed as reference material.

My son Ryan was in first grade during the 1999-2000 school year. In kindergarten he had only been practicing his letters without much assistance from the teacher, and this year he had been really learning to make words, sentences, and even stories by the end of the year. A proud moment for any parent - except maybe a parent who had too much schooling as a document examiner. Tried though I might by suggesting the "correct" form, and with only minimal assistance from teachers who think handwriting is a part of a bygone era, Ryan still made many of what I considered to be unusual letter formations by the end of his first grade year. But, what were those crazy creations of letterforms he was inventing? This child seemed to have several peculiarities, which would make anyone examining an anonymous note shout "yippee!"

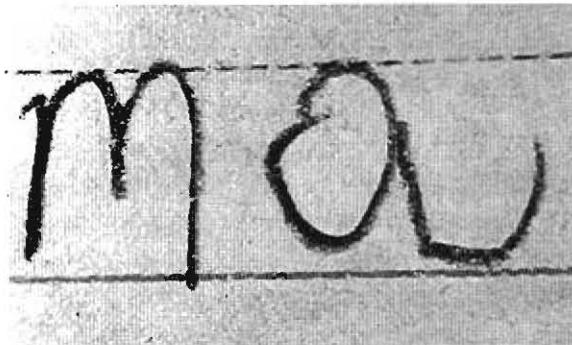
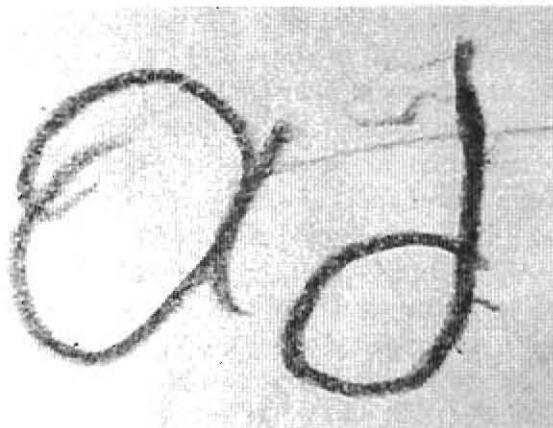
Then a strange thing happened - open house. On display, I saw the handwriting of many of the other children in his class. It was a moment of relief (as a parent) and fright (as a document examiner). "Abnormalities" were

more commonplace than I could possibly imagine, being primarily versed in teenage and graphically mature writing.

THE SAMPLE

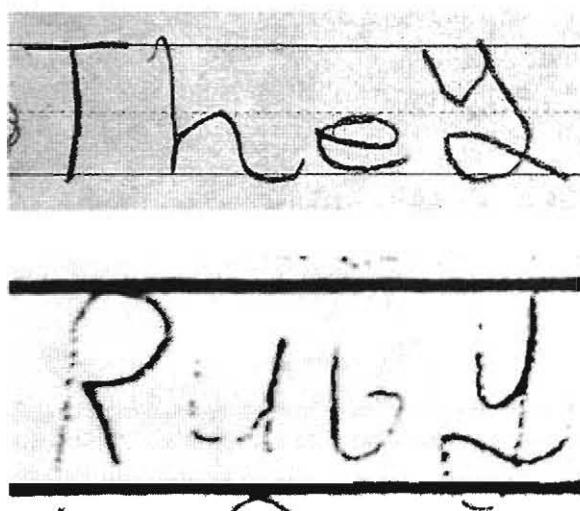
At the end of the school year I had the opportunity to examine 40 first and second graders' handwritings. All samples were written on lined paper with pencil. Approximately half were originals and half were photocopies from the year-end autobiographies put together for the class book. Here are some examples of the letterforms, which would probably be considered individual if found in adult writing.

Example 1



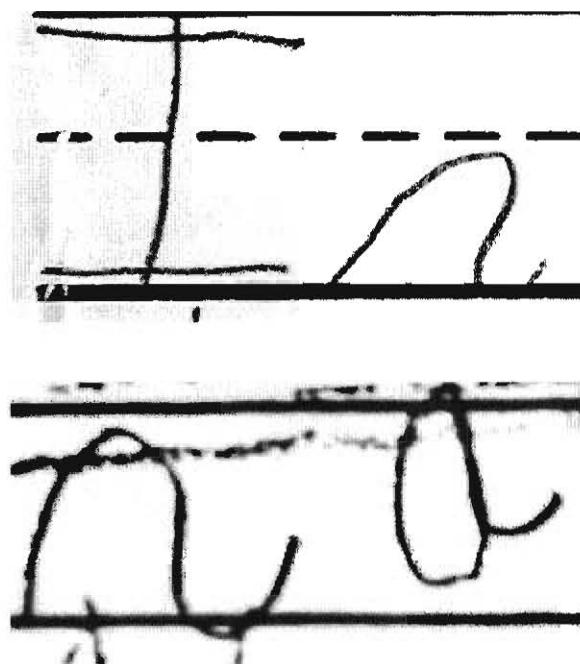
Example 1 shows "a"s and "o"s, which start and complete their ovals far to the left of top center. 10 of 40 children had this characteristic in their handwriting.

Example 2



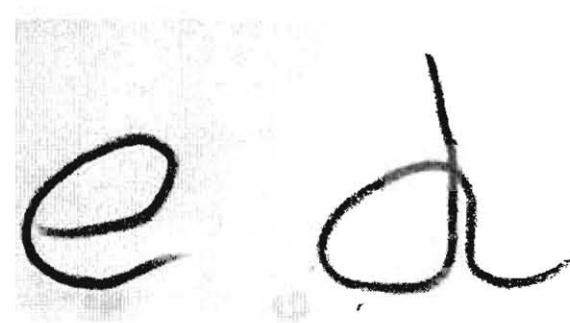
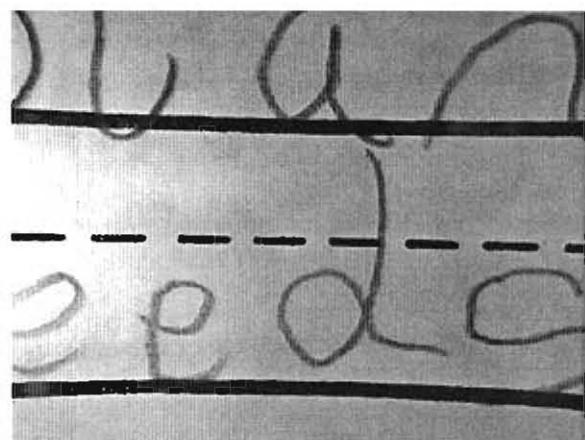
Lower zone letters "pop" above the baseline in Example 2. This was seen in 12 of the students' writings. It especially seemed to occur in the letter "y".

Example 3



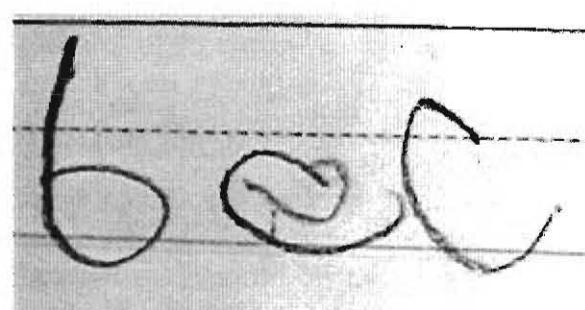
In Example 3 "n"s or "m"s do not begin with an initial downstroke, but start at the baseline and go up to form the initial hump. This was observed in 4 of the writings.

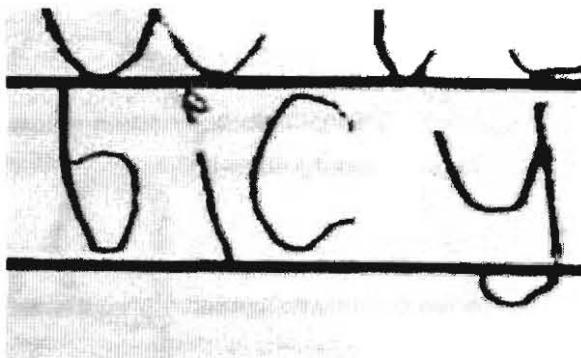
Example 4



Example 4 shows "d"s which begin at the top of the stem, go down and form an oval starting from the bottom and continuing in a clockwise motion. Five children used this form in their handwriting.

Example 5





While not highly unusual even in adult writing, 7 of the 40 children or 17.5% made their "b"s starting at the top of the stem, continuing down and forming the oval in a counter clockwise direction as shown in Example 5.

Additionally, irregular word spacing, letter spacing, slant and letter size were seen commonly throughout the 40 samples.

It is important to note, that these forms were not taught as copybook. It is also important to note that this school, as with many schools today, does not emphasize in its curriculum proper penmanship at the kindergarten and first grade levels. Instead, freedom of expression is not frowned upon, so long as the letters give the same general appearance as the copybook letters.

The students in this school have been practicing a printing system called McDougal, Littell which is used as an introduction to the D'Nealian system of writing by this school. The D'Nealian system, based on a slanted manuscript, was introduced in 1978 by Scott Foresman and developed by Donald Neal Thurber, a first grade teacher. It is supposed to make the transition to cursive easier because most lowercase letters become cursive with the addition of one of only three connecting strokes. The D'Nealian, Palmer, Zaner-Bloser, and McDougal, Little manuscripts are illus-

trated at the end of this paper.

Not everyone agrees that the D'Nealian system is easier or better. D. Kuhl, and P. Dewitz in their paper "The Effect of Handwriting Style on Alphabet Recognition" noted that the difference in letterforms between what they are learning to read and what they are learning to write is often substantial, causing great confusion for some children. However, Ryan's second grade teacher strongly felt that learning cursive early on makes the writing process much easier for children, as they are not required to stop and start so many times. Unlike his first grade teacher she did emphasize handwriting and its proper copybook formation.

CONCLUSION

Clearly, these examples would have to be considered class characteristics rather than individual. The class being that of some primary students of approximately six to eight years of age. As a document examiner, if called upon to examine handwriting of elementary school age, I would be very cautious to hang my hat on a few of what I considered to be unusual letter forms. Instead, as Osborn so well stated it for adult writing as well "...it will clearly appear how superficial and unscientific is that examination of handwriting which gives attention only to forms of letters, with no knowledge of their history and no interpretation of their significance, and it is easily seen how unreliable a conclusion may be if based solely upon comparison of this kind."

The following are actually illustrations of fonts based upon common alphabets. It may seem strange that we would look at fonts, rather than

the actual alphabets, but these are tools readily available to teachers and are becoming more a part of the classroom. They can be found on the website of Educational Fontware, Inc. (<http://educationalfontware.com>).

This classic style font, "Vintage Palmer," is based on a 1923 workbook.

A B C D E F G H I J
K L M N O P Q R
S T U V W X Y Z

a b c d e f g h i j k
l m n o p q r s t u v w x y z

A B C D E F G
H I J K L M N O P Q
R S T U V W X Y Z

a b c d e f g h i j k l m
n o p q r s t u v w x y z

After the Palmer company went out of business, other designers and publishers continued to produce "Palmer" material, but they "modernized" the Palmer style somewhat. EFI refers to this font as "New Palmer."

a b c a d a e a f a g a
h a i a j a k a l a m a n a
o a p a q a r a s a t a u a
v a w a x a y a z a

A B C D E F G H I J K L M N
O P Q R S T U V W X Y Z

Below is the modern (1994 and later) form of Zaner-Bloser style according to EFI.

A B C D E F G H I J K
L M N O P
Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q
r s t u v w x y z

A B C D E F G H I J K L M N O P
Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z

Below are D'Nealian style fonts.

A B C D E F G H I J K L M N O P
Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

A B C D E F G H I J K L M N O P
Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z

The McDougal, Littell fonts are very similar.

A B C D E F G H I J K L M N O P
Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

A B C D E F G H I J K L M N O P
Q R S T U V W X Y Z

References:

1. Albert S. Osborn, *Questioned Documents*, Second Edition, Nelson Hall Co., Chicago.
2. Kuhl, D., and P. Dewitz (1994) "The Effect of Handwriting Style on Alphabet Recognition" Paper presented at the American Educational Research Association Meeting (New Orleans).

Susan E. Abbey is a Certified Document Examiner through the National Questioned Document Association and a candidate for board certification through NADE. She is a graduate of Rice University in Houston, Texas. She has been a practicing Document Examiner since 1997 and she is currently the course instructor for the National Questioned Document Association. She is located in Dallas, Texas. Ms. Abbey's website address is www.handwritingexpert.com.

ENOUGH EXEMPLARS

By

Katherine Koppenhavaer, A.A.S., CDE, Diplomate

Once a writer has mastered the art of handwriting, his/her signature is executed smoothly and easily without conscious awareness of the characteristics of the writing. Since a person's signature is the most frequently executed handwriting, habits become ingrained.

When a forger copies a signature, he must slow down the writing act in order to match the letter forms of the model signature. If he writes too quickly, he will not capture enough characteristics. If he slows his writing in order to imitate the model signature, the line quality deteriorates, the writing is likely to evidence tremor, and it may look drawn instead of written.

A document examiner is frequently asked how many exemplars (known signatures) are needed to make a determination that a questioned signature is or is not genuine. The document examiner's needs will vary according to the circumstances. It might seem that numerous known signatures would be required in every case, but there are circumstances in which a document examiner can give a definite opinion using only one known signature. There are even situations in which no known signatures are necessary. The nature of the document question and the handwriting itself will influence the amount of comparable material needed for review.

In some cases, the significant identifying characteristics of the writing that appear in both a single known signature and the questioned signature give the examiner sufficient evidence

to support an opinion that the questioned signature is genuine. Having more known signatures would allow the examiner to assess the writer's range of natural variation, but natural variation is not a factor in this specific situation in which the first known signature presented contains the same (and sufficient) individualizing features as the questioned document.

In the *State vs. Jeffrey Lee Greenspan* case one known signature was compared to three signatures that the defendant denied writing. As illustrated in Figure 1, there is sufficient agreement in all the questioned signatures when compared with the single known signature. The document examiner had no trouble illustrating the opinion that the questioned signature was genuine.

In the case of *The Federal Office Supply vs. David Thomas AKA David Anthony*, only one signature of David Thomas was available for comparison with a signature of David Anthony. The signatures matched even though the last names differed, as shown in Figure 2. Before the expert witness could be sworn into court, the defendant admitted that he had signed the questioned document.

When a fraudulent signature is a simple forgery (no attempt to imitate the known), one exemplar is often sufficient to demonstrate the differences between the known and the questioned. It is prudent to obtain more than one signature, if available, but sometimes circumstances are such that it is not possible to obtain additional signatures.

When a questioned signature is written with a high skill level that the suspected writer could not execute, a single signature would be sufficient to determine the facts. The caution here is to be sure that the single signature used is a

typical signature representing the true writing skill of the suspect. The known signature must be examined for signs of disguise, and if no additional knowns can be found for verification it may be necessary to qualify the opinion.

When a questioned signature shows obvious signs of forgery not present in the known writing (tremor, patching, penlifts in unnatural places, and blobs of ink on the writing line), one known signature may be enough to prove non-genuineness.

If a writer had an impediment that prevented him from writing in a normal manner, knowledge of that impediment could suffice to determine that a signature is not genuine. For example, the signature of a blind person was in question. The signature block on a form was very small and contained some printed letters. The signature not only stayed within the very small box, it curved around the printed letters, something a blind person's signature would not do.

Since no one writes his signature exactly the same way twice, identical signatures are always evidence of non-genuineness. The questioned signature might be a traced signature, scanned signature, free-hand simulation or a "cut and paste" signature.

Traced forgeries can be identified without exemplars if there are two or more forged signatures copied from the same model or if evidence of tracing (such as carbon residue or a groove along the signature line) are present. This is the case in Figures 3 and 4.

Scanned, computer printed signatures can be identified by examination of the writing line under magnification, although recent improvements in technology are making these identi-

fication more challenging. The signature in Figure 5 was presented as an original signature, but microscopic examination offers proof to counter this claim.

A signature that is cut from one document and pasted onto another can sometimes be detected from the nature of the document. There may be shadows around the signature or pieces of the original document mingled with the new document. If the forger presents another document containing the source signature, the nature of the forgery is evident. Misalignment, trashmarks and shadows often can be found on cut and paste documents.

There are rare cases in which it is possible to identify fraudulent signatures without any exemplars. In certain cases, no knowns may be required because non-genuine writing often appears to be drawn rather than freely written. Albert Osborn addresses this in Questioned Documents when he writes, "Forged writing often shows striking inconsistency with itself in movement and thus contains evidence of unnaturalness that indicates a lack of genuineness without comparison with any other writing whatsoever."

When a questioned signature matches the handwriting of a writer other than the suspect, an identification can be made that the writing was penned by that other person. In this case, no known signatures of the suspect are needed for comparison. In other words, having identified the writer, it is no longer necessary to also eliminate other individuals.

It is important to obtain sufficient knowledge about a writer that will enable a document examiner to draw conclusions. For example, a person who is too ill or infirm to write could not execute a highly-skilled signature. There have been cases in which signatures that have

been presented as authentic were written after the person died. A signature of a person who is on his deathbed will generally show deterioration. Knowing that the writer couldn't write for health reasons or that a person is illiterate is important, especially if there are no known signatures and the questioned signature is penned by a skilled writer.

There are many cases in which a document examiner would want to obtain numerous signatures for comparison with material in question. The average number of recommended signatures is 20 to 25 and/or four to five pages of handwriting depending upon the circumstances. Occasionally a document examiner will want more than 25 signatures especially

QUESTIONED

Jeffrey Lee Greenspan Q-1
Jeffrey Lee Greenspan
 President

Jeffrey Lee Greenspan Q-2
Jeffrey Lee Greenspan
 President
 (Signature)

Jeffrey Lee Greenspan, P.C. Q-3
5432 Alta Vista Road
Bethesda Md. 20814
 (Name and title of addressee of notice)

KNOWN

Sincerely,
Jeffrey Lee Greenspan K-1
Jeffrey Lee Greenspan

Figure 1

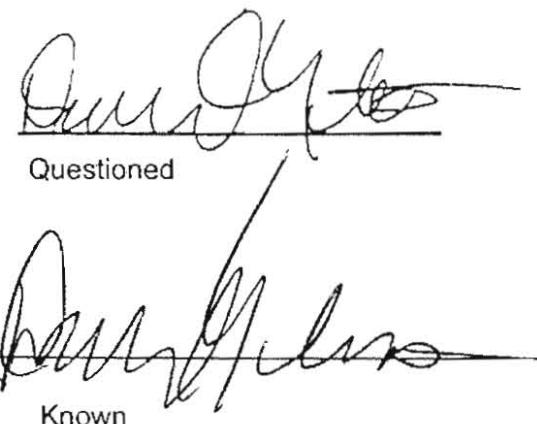


Figure 2

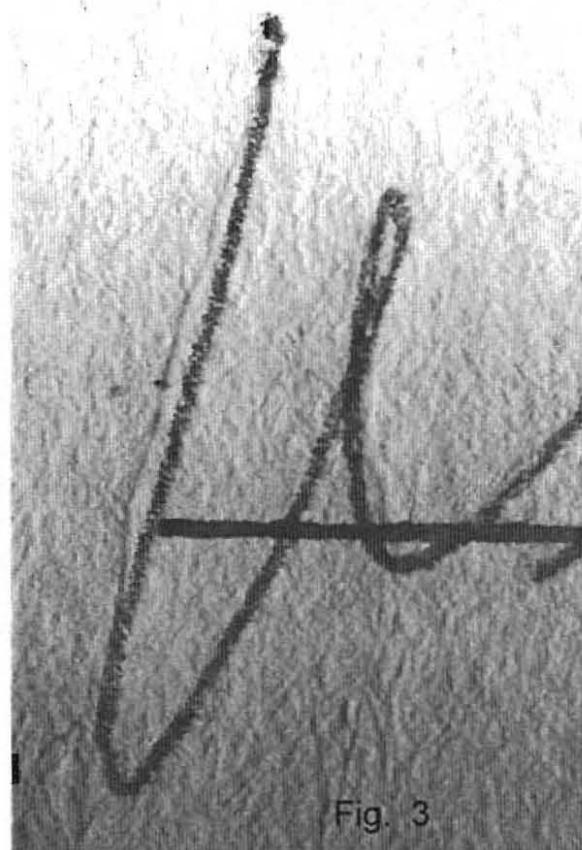


Figure 3



Figure 4



Figure 5

when the questioned signature is oversimplified. In these cases, 100 signatures may not be enough. The number of exemplars needed in each case that a document examiner studies will have to be determined from various factors affecting the case.

Katherine Koppenhaver, A.A.S., CDE, is a past President of NADE and a long-standing member with Diplomate status. She is the Editor of the NADE Communiqué and a frequent contributor and workshop presenter. She holds an associate degree in Criminal Justice and has authored numerous books on handwriting examination. Her business, Forensic Document Examination is located in Joppa, Maryland.

ON BEING SCIENTIFIC IN HAND-WRITING IDENTIFICATION

by

Beryl Gilbertson, M.A., C.Crim.

Abstract

This paper discusses arguments concerning whether or not handwriting identification, commonly seen as part of document examination, can be scientific. The point of view of those who believe "scientific" means numerical standardization of handwriting, as if it were like fingerprints, is discussed here in relation to less rigid approaches. Suggestions for areas of study which are specifically useful to the handwriting identifier are presented. It is also suggested that handwriting identification should be seen as a separate discipline from that of document examination, and treated as a separate discipline drawing its scientific support from elsewhere.

Since the inception of document examination and handwriting identification as forensic disciplines, there have been many arguments about whether or not they can ever be scientific, but there is no consensus on what is meant by "scientific." Traditionally, science has been called "a search for the truth", and even "organized common sense". Many consider mathematics and physics to be the only pure sciences, but disciplines based upon them are accepted as sciences.

Many think "science" and "scientific" must include measurement in properly controlled studies which can be repeated to always produce the same result, especially if they use computerized measurements and analyses. Machine produced data are often given greater

validity than anything which might be seen to be affected by human fallibility and/or subjectivity.

The mathematical and physical sciences have produced formulae, machines, charts, tables, computer programs, reference works and more, for use by properly-trained document examiners, and forensic laboratories to carry out procedures for those who require such service (Moenssens et al, 1986). The results, when carried out by a properly-qualified person, have a great deal of evidential weight as being "scientific."

In the same way, identification of machine-produced printing can also be precisely measured and matched, like fingerprints. It becomes numerical and therefore is perceived to be scientific.

Identification of manually-produced, natural handwriting is a different matter. Many try to develop a "fingerprint" model of handwriting, making computerized measurements and comparisons which, it is hoped, will simplify the identification. Huber and Headrick (1999), discuss at length how handwriting identification may be made "scientific," reasoning in the manner typical of those who are trying to standardize the process.

They suggest that identifiers must allot numbers to represent facts, as this is a "necessary ingredient of most, if not all, disciplines of science" (p. 358). Their stated aim is to develop a method which will allow handwriting to be identified by using an agreed-upon set of numerical values.

They name the International Graphonomics Society (IGS), as one of the scientific groups investigating the "writing process" and carrying out a great deal of experimentation of the type to be found in Simner et al (1996). IGS

forensic research focuses upon measuring handwriting elements in the hope of producing software to do the identification. Some may become useful, but most is of limited application, as Huber and Headrick readily admit.

The inherent problems in this approach are revealed in the discussion of a study of handwriting velocity (Halder-Sinn et al, in Simner et al, 1996), which begins: "The results reveal contradictory tendencies" (p. 481). In spite of this, many believe it will eventually be possible to identify handwriting quickly and accurately by using machines.

From the point of view of neuropsychology and physiology, they are not investigating the "writing process." The handwriting process is everything which occurs in the brain and body to produce the writing, making it unique to each individual, or, in Huber and Headrick's term, heterogeneous. What they call the "writing process" is merely precise measurement of even the smallest details of a script, which they hope will lead to standardized identification procedures, and markedly reduce the time taken to identify a sample.

From this "fingerprint" point of view, anything which is free-hand produced is a problem, whether drawing, numbers, or any kind of handwriting or hand-printing. All major forensic authors agree that subjective assessment of handwriting must occur, because of its normal variation and its liability to be affected by many conditions of change, whether permanent or transitory, dramatic or subtle (Osborn, 1929; Harrison, 1958; Conway, 1959; Hilton, 1982, to name a few). Huber (in Hilton, 1958), agreed that any opinion given by an examiner must be based upon a probability, so that statistical norms are not likely to ever be developed, and a similar doubt is expressed, although not emphasized, in Huber and Headrick.

Even before the advent of personal computers, there was continual effort to put handwriting on the same basis as trace evidence and/or to develop classification systems which might produce standard reference charts (Hilton, 1958; Ansell, 1979; and others).

This search for mathematical precision leads to increasingly restricted methods and procedures, in order to produce opinions which do not need qualification. This limits the identifier to the "ideal" case, where exemplars and disputed samples must be optimal in both quality and quantity, variation must be within narrow limits, and there must be nothing to impede a measuring-and-matching certainty.

This naturally eliminates or restricts those cases which are not "ideal" - cases with limited samples, abnormal variation, strongly disguised writing or showing unusual effects - in all of which the identifier's experience and judgment are crucial.

Many authors discuss what qualifies an examiner, combining document examination and handwriting identification and often switching from one to the other in their discussions. The document examiner must be qualified in whatever technologies and technique he/she uses. Huber and Headrick suggest examiners study in several disciplines. They note that a degree in any mathematical and/or scientific subject gives examiners credibility, because their credentials are seen as evidence that they have acquired a disciplined approach and will skillfully apply the necessary logic.

Bradford and Bradford (1992), amongst others, have said the same, and Moenssens et al, (1986) note that competent document examiners obtain such training. Examiners who constantly upgrade their technical skills can show how their work is scientific, or at least scientifically based, when their evidence is

being brought into question.

Handwriting identification requires different training and knowledge, even if the examiner and identifier are the same person. This is recognized by the many authors who suggest identifiers study psychology, visual-motor skills and research from abroad (Beck, 1964); neuromuscular aspects of handwriting, (Naftali, 1965); psychiatry, (Hilton, 1969), medicine, psychiatry, psychology and law, (Baxter, 1966); and education, (Purtell, 1980), to name only some.

The suggestion that identifiers should study experimental psychology, cognitive psychology, behavioral research methodology and statistics, is valid (Bradford and Bradford, 1992; Huber and Headrick, 1999), as all of these are useful to identifiers. They are the areas of behavioral studies which are accepted as being scientifically based, as is neuropsychology (the study of the correlation between brain and behavior). Basic knowledge of the underlying brain processes of handwriting is especially useful, and a firm basis for any handwriting research.

Conway (1959), talks of two undesirable approaches - that of blind measurement of every minute detail, with no application of other knowledge (i.e., "fingerprinting"), and that of the totally subjective assessment of similarity and difference. He suggests a middle way should be found. Many handwriting identifiers strongly support the views of one or the other of Conway's two approaches, but a growing number of insightful and competent people are now searching for the "middle way."

A major problem is that handwriting identification has been approached in reverse. All other areas of forensic document investigation began with someone asking, "What is it?" Asking, "What is paper?" led to scientific

chemical analysis, which led to machines which can determine if one piece of paper is the same as another. The same type of question underlies everything else in the document field, except handwriting.

This writer has never met anyone else who first asked, "What is handwriting?" and set out to understand all of its processes, development, disorders, and so on. Breaking down the finished handwriting, without understanding how it was built up in the first place, makes people confident they will, eventually, "fingerprint" it. The contradictory nature of so many of their findings is a predictable result.

The first rules of scientific methodology, as all scientists know, is to acquire as much knowledge as possible of the thing being researched and apply a method which takes into account all possible variables which may affect the outcome.

In behavioral research, every factor and its effects must be either accounted for, or noted as a possible reason for a qualified opinion and/or an area for further research. Handwriting is not trace evidence in the same way as fingerprints, and cannot be treated as such. It is the most complex of all human behaviors, subsuming many other complex behaviors. More importantly, for forensic purposes, it subsumes behaviors which are well tested and understood.

For example, studies of such things as eye-tracking, reaction time, sense of time and space, many cognitive anomalies and problems, etc., can be correlated with their observed effects in handwriting. The biochemical effects of the behavioral correlates of various substances are well known, and their effects upon handwriting can be explained scientifically (Gilbertson, 1990).

A handwriting identifier must first know as much as is possible about handwriting from all points of view, as well as the forensic one. There is room for those who are interested in certain types of cases, to become recognized as experts and consultants in, say, the assessment of substance effects, first-language effects, or whatever. Papers are needed.

Bradford and Bradford (1992), note that most identification cases require only visual matching, with magnification and photography the only technologies. In many simple cases, normal practice is the proper listing and description of all evidence, its meticulous comparison, properly illustrated on charts showing the source of each element, and accompanied by detailed discussion and references which explain the significance of it all.

In this regard, the computer-aided creation of comparison charts by Holcomb et al (in Simner et al, 1996), is of note. If machines can prepare high-quality charts, it would be most useful. Huber and Headrick (1999) discuss computer software which measures line lengths, distances between points, areas within loops and angles of intersecting strokes, and which count elements. This seems promising, as it would save the time identifiers spend on this type of preparation before opinion can be developed.

Huber and Headrick are also concerned with terminology. While often over-used, jargon is part of the "scientific persona." Clear communication, in terms the lay person can understand, is always best. Bradford and Bradford, (1992), use acceptable terminology, but if one identifier says "upstroke" and another says "ascender", no one becomes confused, because handwriting is familiar to everyone. However, a standardized terminology is highly desirable, and consensus should be reached, if only to allow for clarity and consistency in both testi-

mony and published works, as well as for its face-value as part of the "scientific" approach.

Even the most competent handwriting identifier is vulnerable to challenge if he/she is not able to present and discuss the evidence in a manner which shows it follows the major aspects of scientific methodology as it applies to human behavior. This method can be easily studied, formally or informally, from the vast amount of literature available.

Still today, the most-asked question is, as it was when Duke pointed it out (in Huber, 1958): "Is handwriting identification really a science?" Conway said handwriting identification can be reduced to the laws of exact science, but no responsible person would say it is an exact science per se. He contended that handwriting identification must stand on one's reasoning and its illustrated support - "...the same basis on which we decide all the weighty problems of human affairs." (Conway, 1959, p.57)

Cole (1946 - cited in Huber and Headrick (1999), has suggested that handwriting identification, "... in the sense that it is a classified, formulated and verifiable knowledge gathered by observation, research and experiment, is a scientific knowledge." (p.352).

In the United States and Canada, the 1923 *Frye v. United States* decision set the standard for expert witness testimony and still underlies all subsequent decisions which have been brought down. It says, in effect, that when direct experimental support is not available, expert testimony deduced from scientific principles or discoveries is acceptable, given that the reference material from which it is deduced is generally accepted within the particular field or discipline from which it derives. (Saferstein, 1987)

Frequently the forensic document examination and identification community tends to consider only its own reference material. It is becoming increasingly a field in which numerical measurement is seen to be the only "generally accepted" approach. Ultimately, this could mean that cases in which crucial aspects of handwritings do not lend themselves to numerical measurement might be tried unjustly, because the opposing side might successfully argue that the evidence is "not scientific."

To combat this, identifiers must, as noted above, learn everything possible about handwriting, and find support for their testimony in reference material which is generally accepted in the particular scientific disciplines which deal with the particular problem.

Literature research is needed, to build up a body of reference material which is specific to handwriting identification. This is a "middle way" which will overcome the shortcomings of purely numerical studies, and ensure all aspects of a case are properly considered and presented in full detail.

In the last analysis, perhaps the answer to "Can handwriting identification ever be a science?" is "No, but we can find scientific support for what we do, not just by numbers, but also by broadly researching the massive amount of scientific knowledge which has been developed outside the forensic document examination community, and applying it where appropriate."

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Beryl Gilbertson, M.A., C.Crim, has been a multidisciplinary investigator of normal and abnormal handwriting since 1978. She holds both an M.A. in Special Education and Neuropsychology with extra courses and a Certificate of Criminology from the University of Toronto, and is a Ph.D. candidate there. She has been consulted by police in major crimes units and has lectured at University of Toronto Extension and Humber College Continuing Education on basic understanding of the handwriting process and its disorders. Ms. Gilbertson resides and works in Toronto, Canada..

In Memoriam - by Phyllis Cook, B.S., BCDE, Diplomate



PAUL S. STAUFFER
1925-1999

This journal issue is dedicated to Paul S. Stauffer, one of the founding fathers of The National Association of Document Examiners, Inc., who passed away last December.

Paul was a brilliant forensic document examiner. He performed his work diligently and cautiously. His reports were well thought out, and attorneys praised him for his meticulous scrutiny of the evidence. When testifying in court, he was nothing less than the model expert witness.

Previous to becoming a document examiner, Paul served as manager of Lee's Carpets. He worked there for quite some time after he graduated from Ursinus College with a B.A. in Business Administration. Subsequently he became the Business Manager of The Baldwin School, a prestigious private girls' school in Bryn Mawr, PA.

In the late '50s and early '60s he became interested in handwriting. He studied it thoroughly. For many years he worked as an ana-

lyst examining handwriting samples and rendering personnel reports to presidents of several firms in the Philadelphia area.

Then Paul turned his skills toward the area of forensic document examinations, and set up his own business in Ardmore, PA. Paul was present at the meeting when the idea of NADE was first discussed. He helped us behind the scenes, and later became the editor of the NADE Journal. He also informally became a partner to Phyllis Cook for five years. During his career he was President of the Eastern Pennsylvania Chapter of IGAS and a member of the World Association of Document Examiners. He continued his document work until failing eyesight caused him to retire.

Those of us who knew him well remember his marvelous sense of humor, his love of travel, bridge, cooking, tennis and dancing. But most of all we remember his selfless concern for others. He was a loyal and valued friend who really never realized what a wonderful person he was.

EXPERT NOTES

AN ANNOTATED BIBLIOGRAPHY

by

Jacqueline Joseph, CDE

Abstract

Jacqueline Joseph, CDE, has written an annotated Bibliography on the topic of *Genuine Tremor in Handwriting vs. The Tremor of Fraud as it Relates to Questioned Document Examination*. The Editorial Board is publishing a section of this Bibliography (covering Intoxication and Handwriting) for two reasons. First, the bibliography itself is a valuable tool for document examiners, and this is a way to bring it to your attention. Second, this type of work is a contribution to the field of document examination and may inspire others to take on a similar project. The Editors

INTOXICATION AND HANDWRITING

1. Journal of Clinical Psychology. 9:284-287, 1953. "The Effects of Alcohol on Handwriting." By Albert Rabin and Harry Blair.
2. Journal of Criminal Law, Criminology and Police Science. 56:372374, 1965. "Effects of Intoxication on Handwriting." By K.S. Puri. Discusses in general the physiological and psychological effects of alcohol on writing. Also points out what might determine intoxicated handwriting. One illustration. K.S. Puri (Document Examiner and Criminologist, Patiala, India).
3. Journal of The National Association of Document Examiners. 22:3-9, Spring 1999. Handwriting and Alcohol. By Beryl Gilbertson, M.A., C.Crim. This paper points out the difficulty of explaining the reasons for an expert opinion that a writing shows effects of alcohol intoxication or withdrawal, and the lack of adequate information available within the forensic literature. It discusses major aspects of physiological dysfunction which occur as a function of alcohol ingestion and how

these can be related to recognized disturbances of handwriting. It suggests that supporting evidence from the scientific disciplines, which is easily obtainable, can be applied in court to answer the question: How do you support your findings? Illustrated. Excellent bibliography. Beryl Gilbertson, M.A., C.Crim. A multidisciplinary investigator of normal and abnormal handwriting since 1978. (Toronto, Canada).

4. International Criminal Police Review. 408:920, Sept. Oct. 1987. "Handwriting and Exogenous Intoxication." By A. Buquet and M. Rudler. Addresses the difficulty of differentiating between shaky handwriting and handwriting which is jerky, twisted, or inhibited. Discusses how to distinguish these among various motor disorders as well as what might occur due to smoking, caffeine ingestion, and alcohol. An overview of principal toxic tremors including alcohol, heavy metals, fungi, pharmaceuticals, and illicit drugs is included. Copiously illustrated.

A. Buquet (Doctor of Science, Cour de Cassation in Paris and Vice-Chairman, French Forensic Chemists' Association). M. Rudler (Director, Forensic Medicine Teaching and Research Unit at the University of Paris, Director, Toxicology Laboratory of the Paris Prefecture of Police Forensic Science Laboratory, Cour de Cassation, Paris).

5. Perceptual and Motor Skills. 9:227-236, 1959. "Effects of Alcohol on the Graphomotor Performances of Normals and Chronic Alcoholics." By Clarence A. Tripp, Fritz A. Fluckiger, and George H. Weinberg.

Jacqueline A. Joseph, B.A., CDE is a certified document examiner and member of NADE. As a practicing forensic scientist since 1992, she is the owner of Accurate Document Examiners in Portland, Oregon. She lectures at Portland State University and various professional groups and has given expert witness testimony in court, arbitrations and depositions. Ms. Joseph's website address is: <http://www.jjhandwriting.com>.

DIGITAL EXAMINATION OF A MICRO-FILMED DOCUMENT

by

Kay Micklitz, CDE

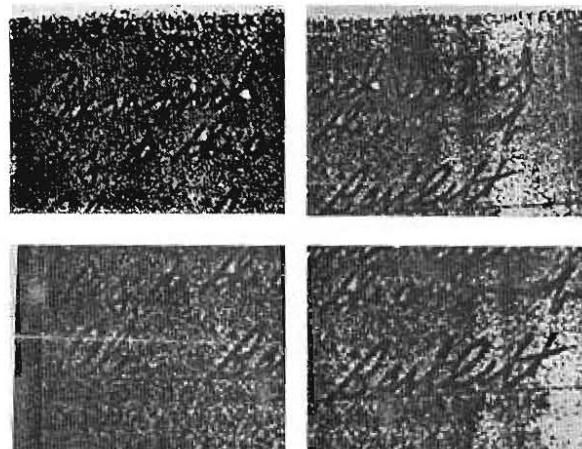
A request was made for examination of a questioned endorsement on an insurance beneficiary payment check that was part of an estate. The original check had been microfiche filmed and then destroyed. Submitted for examination was the photocopy of the printout of the microfiche filmed check endorsement.

The photocopied evidence submitted was of poor quality and difficult to examine as presented. In order to examine the endorsement on the photocopy, a digital camera (Sony Mavica FD73) was used to photograph the signature. The photocopied document was placed on a piece of clear glass which was then placed on a Quadra Pod camera stand. A small clip-on lamp with a 25 watt bulb was then positioned directly under the glass and the photocopied document. A small fan was used to keep the glass cool in order to avoid possible burning of the photocopy from the heat of the back-lighting source. The camera was then positioned above the photocopied document. Several experiments were made using the different camera settings and the negative art option proved to give the best results in digitally capturing the signature endorsement. The endorsement and signatures were photographed for the examination (see figures below).

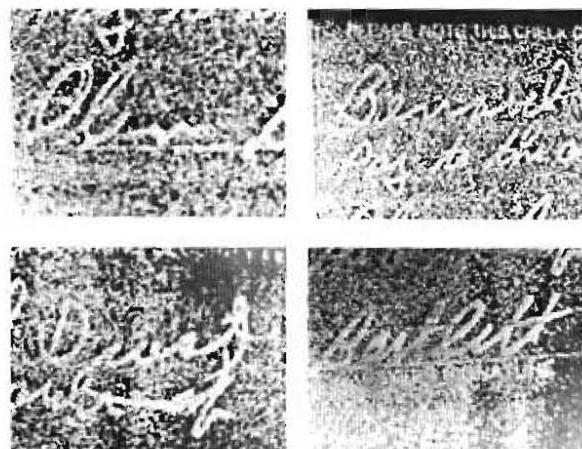
The insurance beneficiary check in question was part of the estate of a deceased person and thus no consideration was necessary as to the possibility of authorship of that individual. A comparison of the handwriting exemplars from the suspect writer was made against the printed, negative-art photographs. Although it was necessary to qualify the opinion of identification subject to examination of the original document, when confronted with the evidence, the suspect made full restitution of the monies taken by the fraudulent endorsement

and cashing of the insurance beneficiary check.

The following images were taken of the photocopy of the printout of the microfilmed check endorsement without the use of backlighting.



The following images were taken of the photocopy of the printout of the microfilmed check endorsement using backlighting.



Kay Micklitz, CDE, is a board certified document examiner. She holds a Paralegal certificate from the University of Texas, San Antonio, and has an extensive background in civil litigation. Kay joined NADE in 1995 and earned her CDE in 1997. She completed studies through the National Questioned Document Association, and the American Institute of Applied Science for Questioned Documents and Police Photography. Kay is a certified instructor for Texas police officers and private investigators. She is court qualified and has been appointed by federal, state and county courts to examine documents.

FORENSICALLY SPEAKING

Compiled by Phyllis Cook, B.S., BCDE,
Diplomate

+ One source of useful measuring instruments is from medical supply companies. Kay Micklitz has purchased an International Standard SFTR Pocket Goniometer, which is a clear plastic template for measuring angles. Physical therapists use this instrument to measure the joint angles and range of motion of their patients. The instruments are marked in one degree increments from either 0-90, 0-180 or 0-360 degrees and cost approximately \$20. You can order them from Sammons Preston Healthcare at 1-800-323-5547.

+ An excellent way to illustrate horizontal expansion or neglect in a handwriting is to prepare grid transparencies. These overlays give an immediate visual portrait of the spacing, whether wide and sprawling, tight and restricted, or fairly uniform. They show spacing between words and lines, how much space a person leaves after capital letters to begin sentences and paragraphs, spacing between initials, after punctuation, in letter groups, etc. This technique is a wonderful aid to the forensic document examiner.

+ Paper is one of the most absorbent materials. Ninhydrin, used to image fingerprints on paper, ruins indented handwriting because the paper is sensitive to it.

+ Mechanical pulping is used to manufacture inexpensive paper, while chemical pulping is used to manufacture a fine quality paper stock.

+ An infrared scope can determine whether or not the ink on a document luminesces differently. It can also help to determine if paper has changed color (bleached by sun or strong

light). Expect to pay approximately \$2000 for this piece of equipment.

+ Various indications that writing was made by a ball-point pen are: blobs of ink dropped onto a letter after a curve has been written, tracks left by on the writing line by the writing instrument, indentations in the paper left by the barrel tip, occasional skips in the writing line.

+ Kodak has an interesting website on the topic of film and digital photography and their use in law enforcement and the courts. <http://www.kodak.com/global/en/professional/hub/law/filmdig/index.shtml>

+ It is a good exercise for a document examiner to read anonymous notes numerous times to reveal habits of the writer such as: syntax (patterns of formation of sentences and phrases), diacritics (marks added to letters such as tildes, cedillas, etc.), sentence order, idiomatic expressions, use of parentheses, grammar, misspellings, words set off by quotation marks, dashes, dots, etc.

+ One security feature of the new US currency is a security thread that runs through all denominations above \$1. The position of this thread varies with each denomination to prevent criminals from washing a \$5 bill and reprinting it as a \$50. *Photonics vs. Counterfeitors*, Elizabeth M. Lockyer and Charles T. Troy, International Journal of Forensic Document Examiners, Volume 5, Jan/Dec 1999, pg. 291

+ The use of the US Postal Zip Code before 1963 is a significant inconsistency in a document. *Forensic Examination of Constructed Documents*, Nancy N. Berthold and Gregory R. DaIzell, International Journal of Forensic Document Examiners, Volume 5, Jan/Dec 1999, pg. 386

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